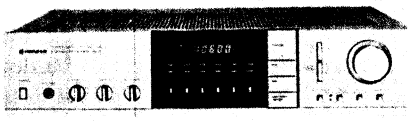
PIONEER

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ARP-009-0

COMPUTER CONTROLLED STEREO RECEIVER

SX-5

MODEL SX-5 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KU	120V only	U.S.A. model
KC	120V only	Canada model
S	110V, 120V, 220V and 240V (Switchable)	General export model
S/G	110V, 120V, 220V and 240V (Switchable)	U.S. Military model
YP	240V only	Australia model

- **This service manual is applicable to the KU type.**
- **For the circuit description, please refer to the model SX-7 service manual (ARP-047).**
- **Ce manuel d'instruction se refère au mode de réglage, en français.**
- **Este manual de servicio trata del método de ajuste escrito en español.**

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1. SPECIFICATIONS

Amplifier Section

Continuous Average Power Output is 30 watts* per channel, min., at 8 ohms from 20 Hertz to 20,000 Hertz with no more than 0.02% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, 8 ohms, from AUX/VIDEO)
- continuous rated power output . . No more than 0.02%
- 15 watts per channel power output . . . . . No more than 0.02%

Intermodulation Distortion (50 Hertz; 7,000 Hertz = 4 : 1, 8 ohms, from AUX/VIDEO)
- continuous rated power output . . No more than 0.02%

Damping Factor (20 Hertz to 20,000 Hertz, 8 ohms) 50

Input (Sensitivity/Impedance)
- PHONO . . . . . 2.5mV/50 kilohms
- TUNER, AUX/VIDEO, TAPE PLAY . . . . . 150mV/50 kilohms

Phono Overload Level (T.H.D. 0.1%, 1,000Hz)
- PHONO 130mV

Output (Level/Impedance)
- TAPE REC . . . . . 150mV/2.2 kilohms

Frequency Response
- PHONO (RIAA Equalization) 30Hz to 15,000Hz±0.3dB
- TUNER, AUX/VIDEO, TAPE PLAY . . . . . 10Hz to 50,000Hz $^{+0.5}_{-3}$dB

Tone Control
- BASS . . . . . ±8dB (100Hz)
- TREBLE . . . . . ±8dB (10kHz)

Loudness Contour (Volume control set at –40dB position) . . . . . +6dB (100Hz)

Hum and Noise (IHF, short circuited A network)
- PHONO 76dB
- AUX/VIDEO, TAPE PLAY 96dB

FM Tuner Section

Usable Sensitivity . Mono; 11.2dBf (IHF) (1.0μV, 75 ohms)
50dB Quieting Sensitivity . . . . 16.3dBf (1.8μV, 75 ohms)
Stereo; 37.2dBf (19.9μV, 75 ohms)
Signal-to-Noise Ratio . . . . . Mono; 75dB (at 85dBf)
Stereo; 70dB (at 85dBf)

Distortion (at 65dBf)
- Mono 100Hz; 0.15%
- 1kHz; 0.15%
- 6kHz; 0.2%
- Stereo 100Hz; 0.3%
- 1kHz; 0.3%
- 6kHz; 0.4%

Capture Ratio 1.0dB
Alternate Channel Selectivity 400kHz; 60dB
Stereo Separation 1kHz; 40dB
30Hz to 15kHz; 35dB
Frequency Response . . . . . 20Hz to 15kHz +0.5dB, –1dB
Spurious Response Ratio 65dB
Image Response Ratio 65dB
IF Response Ratio 90dB
AM Suppression Ratio 55dB
Subcarrier Product Ratio 40dB
SCA Rejection ratio 60dB
Muting Threshold 29.3dBf (8μV)
Antenna Input . . 300 ohms balanced, 75 ohms unbalanced

AM Tuner Section

Sensitivity
- IHF, ferrite antenna 300μV/m
- IHF, external antenna 15μV

Selectivity 27dB
Signal-to-Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 73dB
Antenna . . . . . Built-in ferrite loopstick antenna

Miscellaneous

Power Requirements . . . . . AC 120V, 60Hz
Power Consumption . . . . . 200W (UL)
Dimensions . . . . . 420(W) x 98(H) x 311(D) mm
16-9/16(W) x 3-7/8(H) x 12-1/4(D) in
Weight (without package) . . . . . 5.8 kg (12 lb 13 oz)

Furnished Parts

FM T-type Antenna 1
Dry Battery SUM-3 "AA" 2
Station Card 2
Operating Instructions 1

**Measured pursuant to the federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifier.*

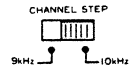
NOTE:
Specifications and design subject to possible modification without notice.

SX-5

SETTING USE THE AM CHANNEL STEP SWITCH (on the rear panel)

Before the receiver leaves the manufacturing plant, this switch is set to the channel allotment plan of the destination. For the U.S.A., it is set to 10kHz. Check that the switch is set properly before use.
Set it to the 9kHz position when the channel allotment plan is changed and the intervals between the AM broadcasting stations change from 10kHz to 9kHz units.

NOTE:
Contact your dealer and inquire if you are not sure about the channel allotment plan.



10kHz position

LOADING THE BATTERIES

Two size "AA" dry batteries are provided as accessories. They are used to retain the station presetting memory functions.
Before using the unit, disconnect the power cord and load the batteries into the compartment on the rear panel as follows:

1. Slide the lid in the direction of the arrow and open the compartment (see Fig. 1).
2. Load the batteries with the polarities properly aligned with the marks on the inside of the compartment (see Fig. 2).
3. Align the tab of the lid with the interlocking hole and depress the lid lightly.

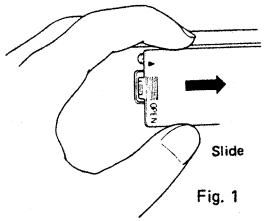


Fig. 1

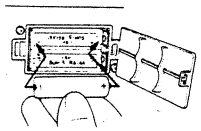


Fig. 2

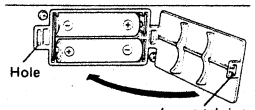


Fig. 3

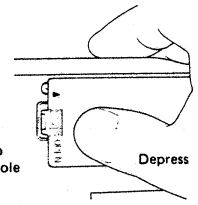


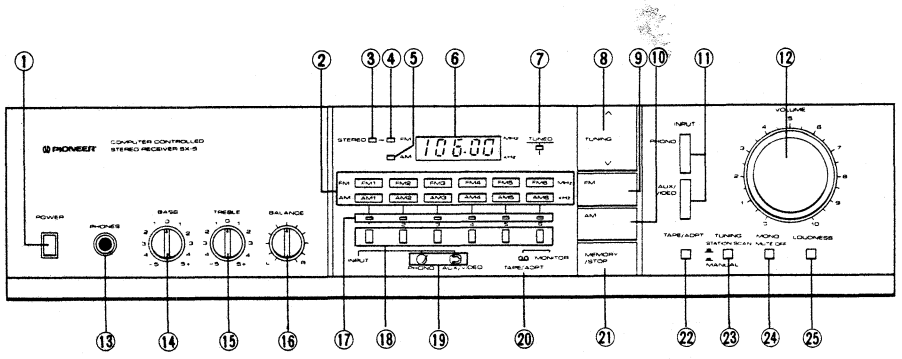
Fig. 4

Battery Precautions:

If batteries are incorrectly used, they may leak or even break open inside the battery holder. Observe the following precautions when inserting and replacing the batteries.

1. Always be sure the + and – ends are aligned properly as shown above and as marked on the battery holder.
2. Do not use new batteries and partly used batteries at the same time.
3. Do not use different brands and types of batteries at the same time.
4. There are rechargeable dry cell batteries and non-rechargeable dry cell batteries. Always read the notes on the battery to be sure which kind you have.
5. When replacing the batteries, always use the same type of batteries (carbon zinc) as the ones originally provided with the receiver. Do not use alkaline and nickel cadmium type batteires.

2. FRONT PANEL FACILITIES



① POWER SWITCH

Power is supplied to the unit when this switch is depressed ("in" position).

② STATION DISPLAY WINDOWS

Insert the frequency cards of the broadcasting stations which have been preset into the STATION CALL switches.

③ FM STEREO INDICATOR

This lights when receiving an FM stereo program.

④ FM INDICATOR

This lights when receiving the FM broadcasts. (This lights when depressed the FM switch).

⑤ AM INDICATOR

This lights when receiving the AM broadcasts. (This lights when depressed the AM switch).

⑥ DISPLAY

This indicates the broadcasting frequency when a station has been tuned in.

⑦ TUNED INDICATOR

This lights when the optimum tuning point has been located during reception. It blinks when stations are being searched in the STATION SCAN mode.

⑧ TUNING SWITCH

This switch is used to tune in the station.
Depress the ∧ part to tune in a station with a higher frequency than that on the display; depress the ∨ part to tune in a station with a lower frequency.

⑨ FM SWITCH

Depress this switch for FM reception.

⑩ AM SWITCH

Depress this switch for AM reception.

⑪ INPUT SELECTOR

PHONO: Press this switch when playing a record on the turntable connected to the PHONO jacks.

AUX/VIDEO: Press this switch when listening to an audio component connected to the AUX/VIDEO jacks.

⑫ VOLUME CONTROL

Use this control to adjust the output level to the speakers and headphones. Turn it clockwise to increase the output level.

⑬ PHONES JACK

Plug the headphones plug into this jack when you want to listen through your stereo headphones.
When the headphones are connected, no sound is heard from the speakers.

⑭ BASS CONTROL

Use this control to adjust the bass of the sound. When the control is moved to the right (+ direction), the bass is emphasized, and when it is moved to the left (− direction), the bass is attenuated.

⑮ TREBLE CONTROL

Use this control to adjust the treble of the sound. When the control is moved to the right (+ direction), the treble is emphasized, and when it is moved to the left (− direction), the treble is attenuated.

⑯ BALANCE CONTROL

Use this control to balance the volume of the left and right channels. If the sound appears to be louder on the right, it means that the volume of the right channel is higher. Turn the balance control to the left and adjust. Conversely, if the sound appears to be louder on the left, it means that the volume of the left channel is higher. Therefore, turn the balance control to the right and adjust.

⑰ STATION INDICATORS

The indicator that corresponds to the STATION CALL switch which has been depressed lights.

NOTE:
When presetting a station, all six indicators light in sequence for about 5 seconds.

⑱ STATION CALL SWITCHES

These are pressed to call out preset broadcasting stations and to preset the station.
To call out a station, first set the desired frequency band using the FM or AM switches and then press the desired switch.

⑲ INPUT INDICATORS

These light when the INPUT (PHONO or AUX/VIDEO) switch is pressed.

⑳ TAPE/ADPT INDICATOR

This lights when the TAPE/ADPT switch is depressed.

㉑ MEMORY/STOP SWITCH

This switch is used to preset the broadcasting stations into the STATION CALL switches.
This switch is also used to stop the tuning operation during the STATION SCAN function.

㉒ TUNING SELECTOR

This is used to select the reception mode.

STATION SCAN (released position):

When the TUNING switch is depressed, the broadcasting stations start to be scanned and this procedure stops once a station has been picked up. The program of that station is heard for about 5 seconds. The tuning operation then resumes and sound is heard in the same way. Each of the stations is thus picked up in turn.
When the MEMORY/STOP switch is depressed once you hear the sound of the desired program, the tuning operation stops and the unit is set to the reception mode.

MANUAL (depressed position):

For manual tuning. Depress the TUNING switch and tune in the station manually, each time the TUNING switch is depressed, the frequency changes in 100kHz steps during FM reception and in 10kHz steps during AM reception. When the TUNING switch is kept depressed, the frequency is continuously scanned. Tuning stops when the upper or lower limit of the frequency band id. reached.

NOTE:
AM CHANNEL STEP switch on the rear panel should be set to correct (10kHz) position.

㉓ TAPE/ADPT SWITCH

This is depressed when using a tape deck or adaptor unit connected to the rear panel TAPE/ADAPTOR jacks.

㉔ MONO MUTE OFF SWITCH

The sound is heard in mono when this switch is set to the depressed position. Normally, the switch is kept at the released position. During the FM reception, the noise is reduced and reception is made clear. When the station is distant and its signals are weak, depress the switch and tune in the station manually.

㉕ LOUDNESS SWITCH

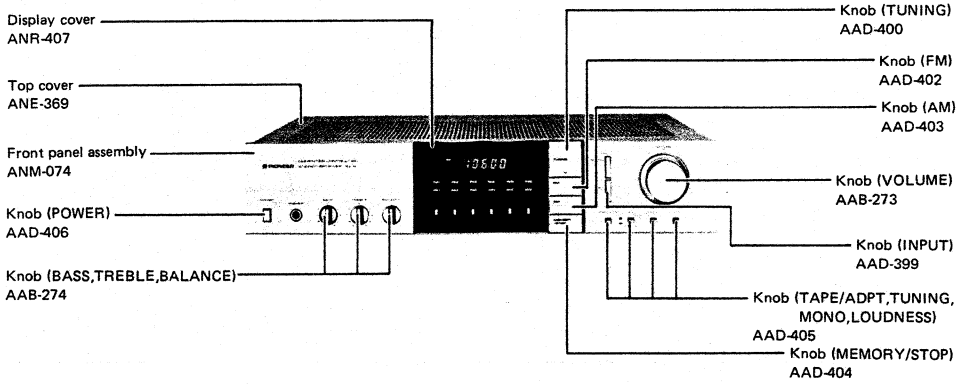
When listening to a performance with the VOLUME level is low, depress this switch and the bass and treble will be accentuated.
When the volume is low, the human ear finds it harder to hear the bass and treble than when the volume is high. The LOUDNESS switch is thus designed to compensate for this deficiency.

3. PARTS LOCATION

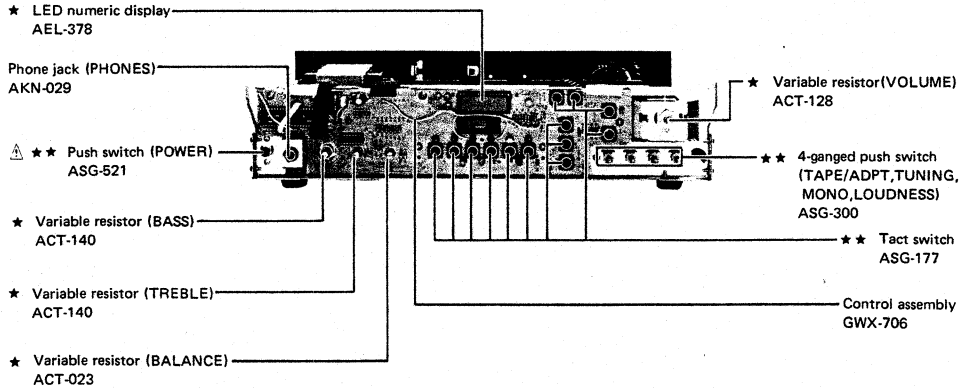
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front Panel View

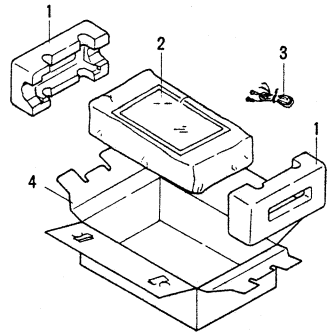


Front View with Panel Removed

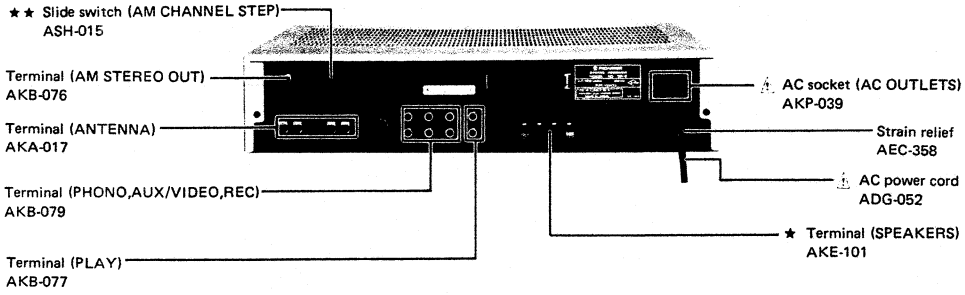


4. PACKING

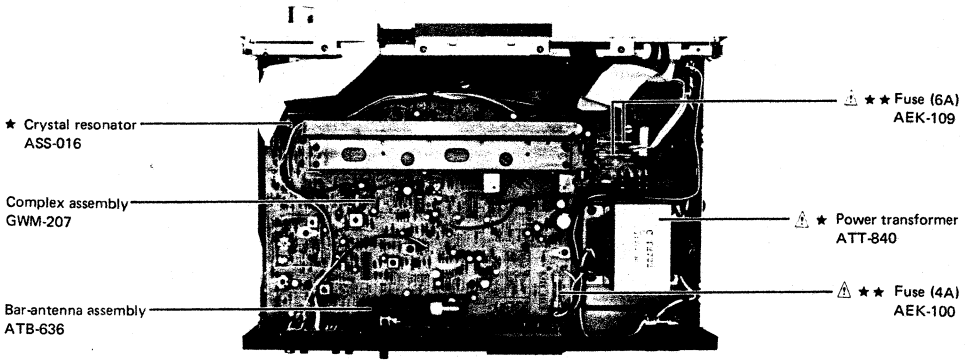
Mark	No.	Part No.	Description
	1.	AHA-294	Side pad
	2.	ARB-438	Operating instructions
	3.	ADH-004	T-type FM antenna
	4.	AHD-953	Packing case



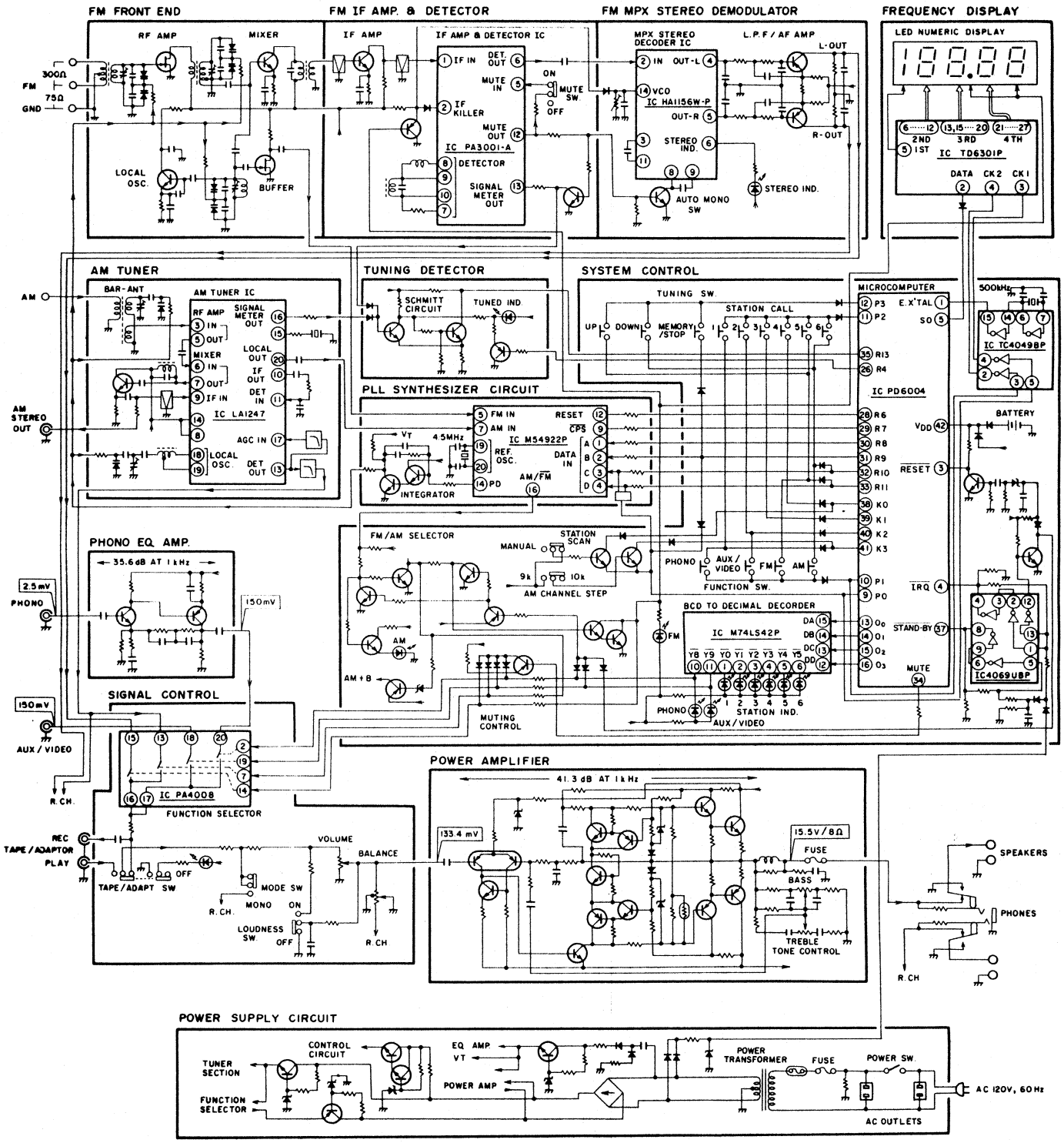
Rear Panel View



Top View

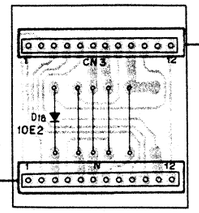


5. BLOCK DIAGRAM

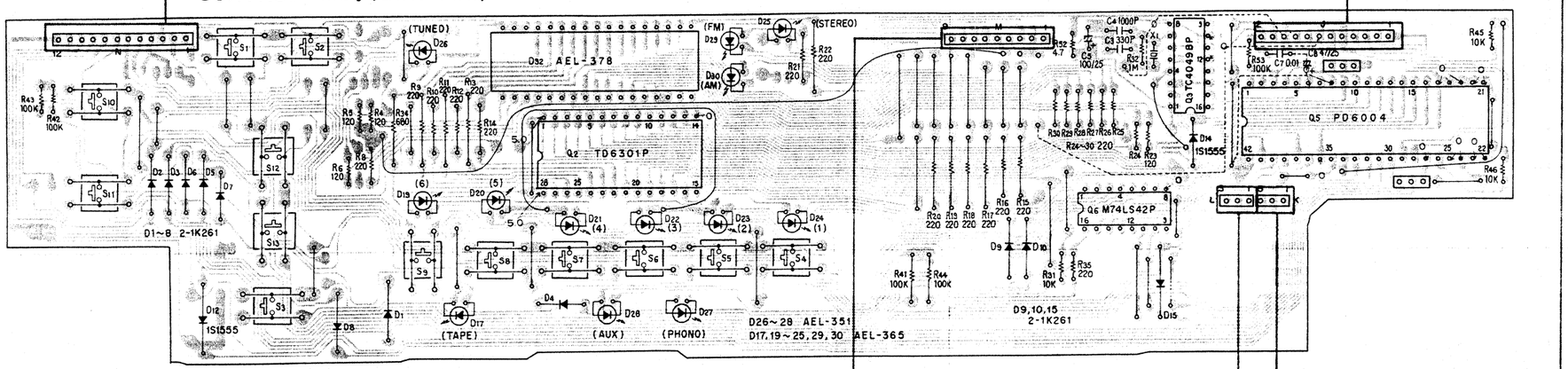


6. P.C.BOARDS CONNECTION DIAGRAM

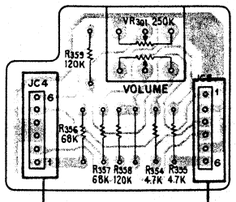
CONNECTOR Ass'y



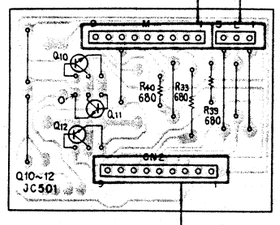
CONTROL Ass'y(GWX-706)



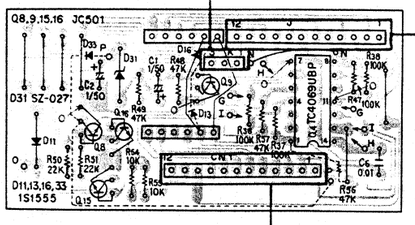
VOLUME Ass'y



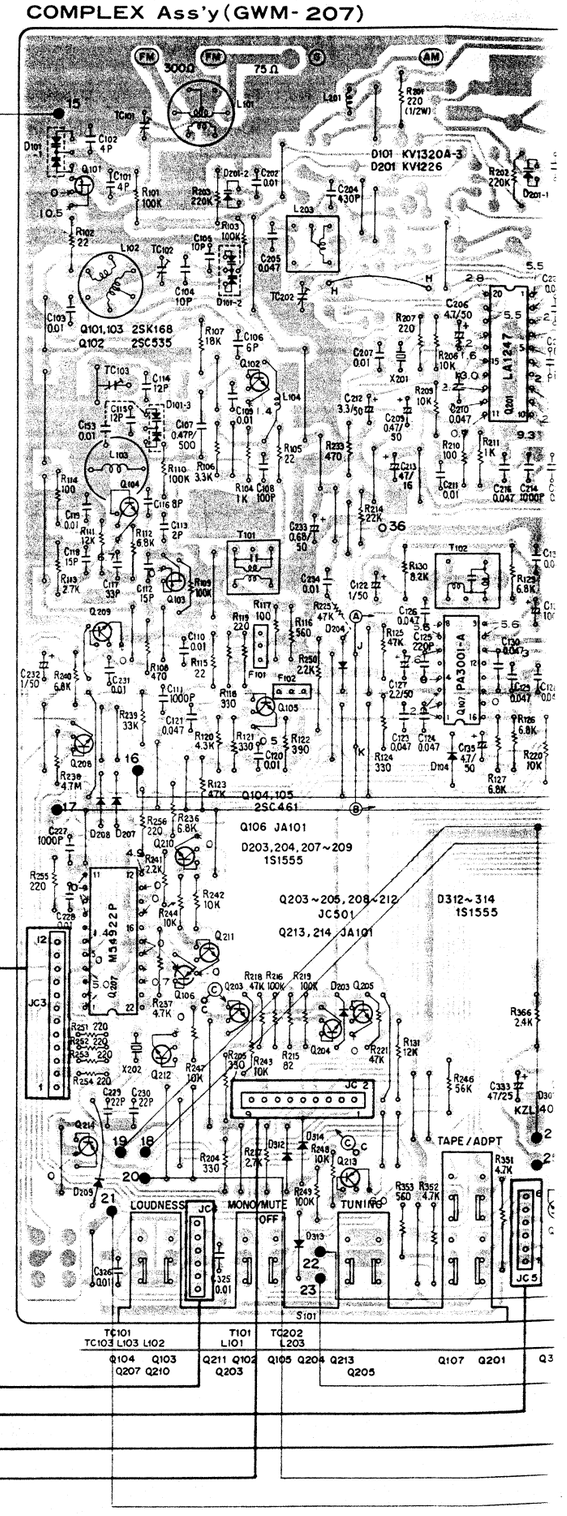
CONTROL Ass'y(A)



CONTROL Ass'y(B)



COMPLEX Ass'y(GWM-207)



7 8 9 10 11 12

A B C D

7)

PHONO AUX/VIDEO REC/OUT PLAY/IN

D101 KV1320A-3
D201 KV1226

Q202 2SC1919

Q301,302 2SC1919
Q303,304 2SA726S

AM STEREO OUT

FU101 4A

S103:POWER

C101:001/AC/125

S103

T101:POWER TRANSFORMER

T101

OR BLK OR WHT BRN

AC120V 60Hz

SWITCHED 100W UNSWITCHED 100W

SUM3×2

R505 47/10W

HEADPHONES JACK Ass'y

HEADPHONES

R430 330(1/2W)
R429 330(1/2W)

46 47 48 49

R L

SPEAKERS 15.5V/8Ω

SWITCH Ass'y

AM CHANNEL STEP

S102

9kHz—10kHz

D104,105 1S1555 Q109 JC501 Q110,111 2SA726S

D310,311,315,316 1S1555

Q309,310 2SC2362
Q311,312,319,320 2SA1115 FAF
Q313,314 JC501
Q315~318 2SC2603
Q321,322 2SA850

Q305,306 2SA798
Q307,308 2SC1845
Q323,324 2SC1735
Q325,326 2SB686
Q327,328 2SD716

Q402,403 2SD880
Q404 2SA684A
Q405 JC501

D312~314 1S1555

D306~309 WZ-046

D302~305 1S1555

D407,408 1S2471

D412~415 GP-25D

KZL140

KZL056

KZL072

1S1555

MZ-290

2SC1384

MZ-150

6WZ-048

KZL120

PA4008

HA1156W-P

PA3001-A

LA1247

TAPE/ADPT

TUNING

BALANCE

TREBLE

BASS

TP-L

TP-R

JC1 JC2 JC5

T201 L202 VR306 VR101 VR305 VR302 VR303 VR304

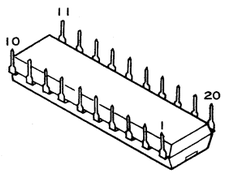
Q205 Q107 Q201 Q316 Q328 Q320 Q324 Q306 Q310 Q202 Q108 Q326 Q308 Q312 Q318 Q111 Q109 Q302 Q310 Q304 Q314 Q322 Q329 Q313 Q309 Q301 Q303 Q321 Q317 Q325 Q307 Q215 Q311 Q404 Q401 Q327 Q305 Q319 Q323 Q315 Q206 Q403 Q402 Q405

7. SCHEMATIC DIAGRAM

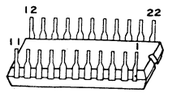
NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.

External Appearance of Transistors and ICs

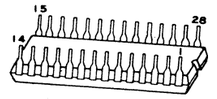
LA1247



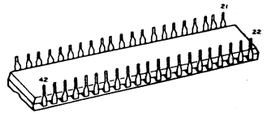
M54922P



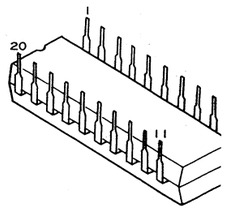
TD6301P

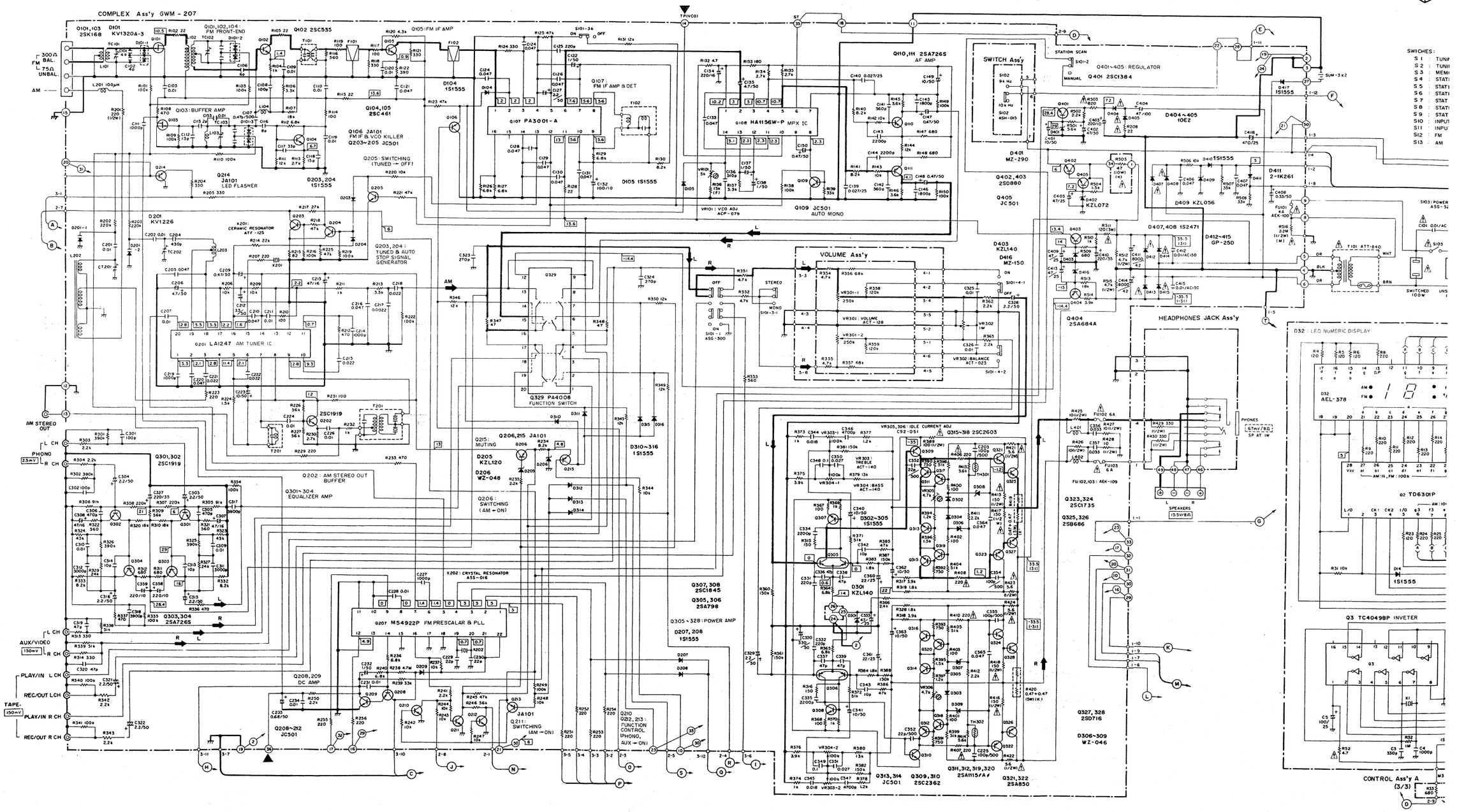


PD6004

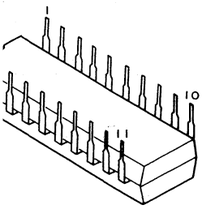


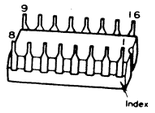
PA4008



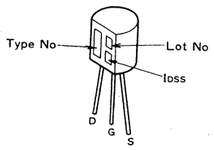


PA3001-A
TC4049BP
M74LS42P

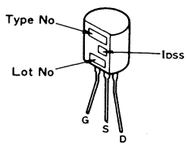




2SK61



2SK168



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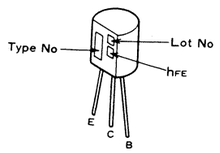
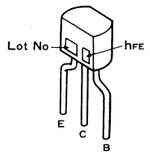
2SC2240
2SA1015



2SC2603/A/
2SA1115/A/



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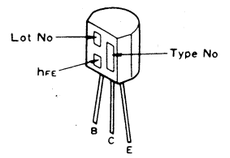
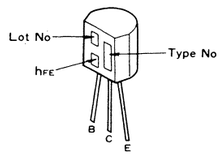
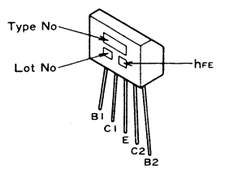


A

2SC1919
2SC710
2SA726S



2SA798



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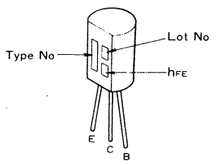
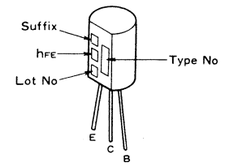
2SC1845
2SB560
2SA992



2SA684A



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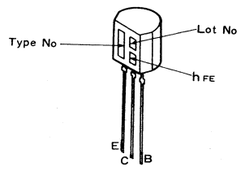

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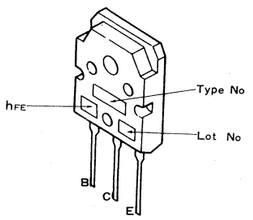
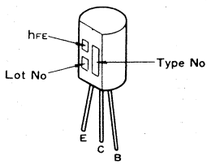
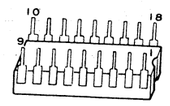


B

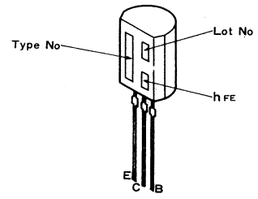
2SC1384



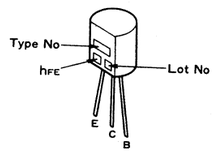
PA0001



2SD438



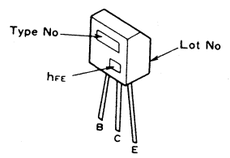
JA101
JC501



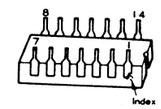
C

—

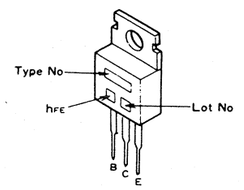
2SC461
2SC535



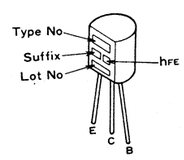
HA1156W-P
TC4069UBP



2SD880
2SD313



2SC1775A



D

SWICHES :

S 1	: TUNING (UP)	ON — OFF	S 101 - 1	: TAPE/ADPT	ON — OFF
S 2	: TUNING DOWN	ON — OFF	S 101 - 2	: TUNING	STATION SCAN — MANUAL, STEREO/ON — MONO/OFF
S 3	: MEMORY / STOP	ON — OFF	S 101 - 3	: MONO/MUTE OFF	
S 4	: STATION CALL 1	ON — OFF	S 101 - 4	: LOUDNESS	ON — OFF
S 5	: STATION CALL 2	ON — OFF	S 102	: AM CHANNEL STEP	9kHz — 10kHz
S 6	: STATION CALL 3	ON — OFF	S 103	: POWER	ON — OFF
S 7	: STATION CALL 4	ON — OFF			
S 8	: STATION CALL 5	ON — OFF			
S 9	: STATION CALL 6	ON — OFF			
S10	: INPUT (PHONO)	ON — OFF			
S11	: INPUT (AUX / VIDEO)	ON — OFF			
S12	: FM	ON — OFF			
S13	: AM	ON — OFF			

The underlined indicates the switch position.

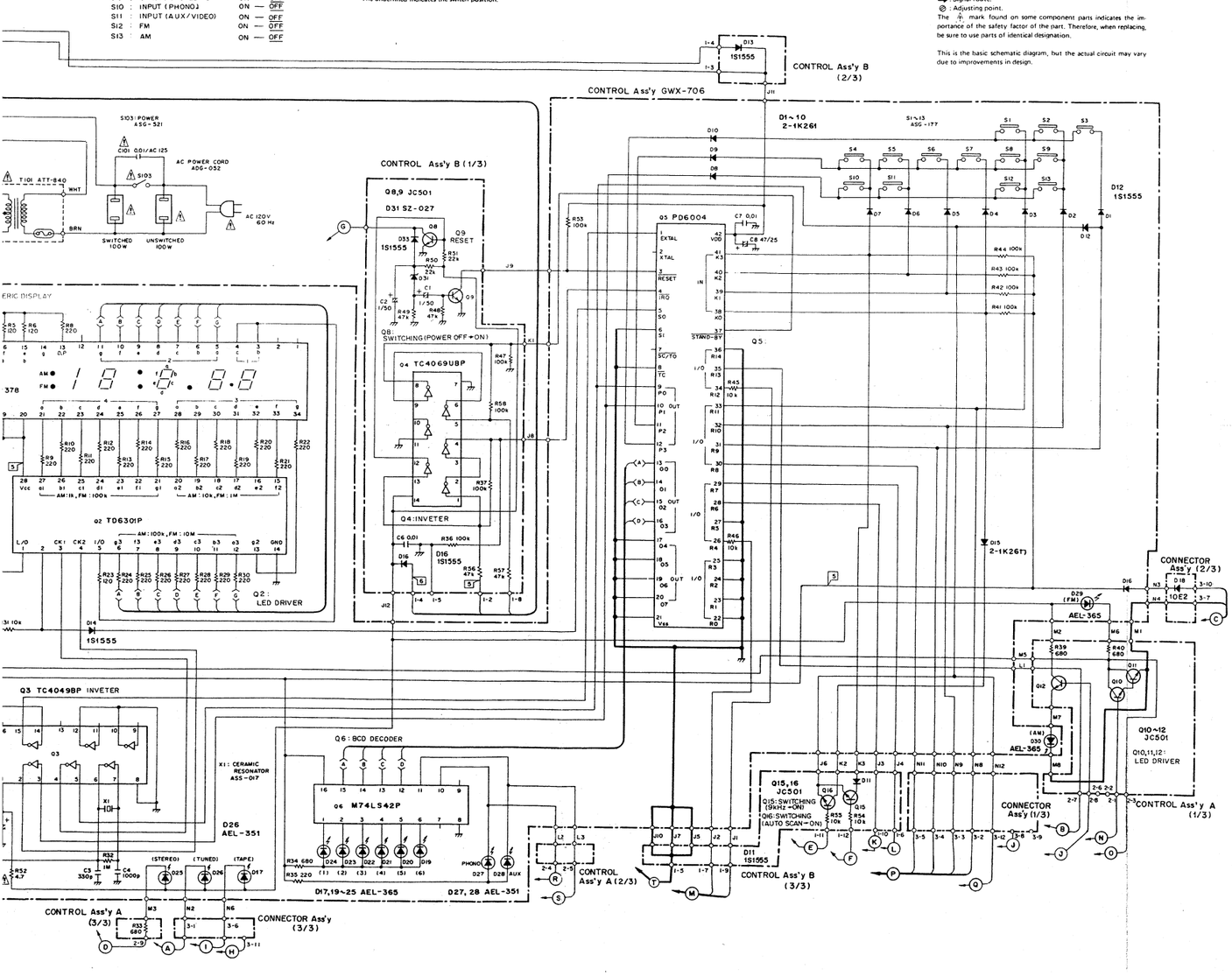
1. RESISTORS:
Indicated in Ω, ¼W, ±1/8w, ±5% tolerance unless otherwise noted
k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10%,(M) : ± 20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
: Signal voltage at 30 W + 30 W 8Ω output (1kHz)
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.

4. OTHERS:
➡ : Signal route.
◎ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.



8. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 .....*	*RD¼PS 5601 J*
47kΩ	*47 × 10³*	*473 .....*	*RD¼PS 4703 J*
0.5Ω	*0R5*	*.....*	*RN2H 0R50 K*
1Ω	*010*	*.....*	*RS1P 0100 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 ....*	*RN¼SR 5622 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

Mark	Part No.	Symbol & Description	
⚠ ★	ATT-840	T101	Power transformer
⚠	ACG-017	C101	Ceramic capacitor
⚠ ★★	ASG-521	S103	Push switch (POWER)
⚠ ★★	AEK-100	FU101	Fuse (4A)
⚠ ★★	AEK-109	FU102,FU103	Fuse (6A)
⚠	AKP-039	AC socket (AC OUTLETS)	
⚠	ADG-052	AC power cord	
	GWM-207	Complex assembly	
	GWX-706	Control assembly	
	AKE-101	Terminal (SPEAKERS)	
	AKB-076	Terminal (AM STEREO OUT)	

Complex Assembly (GWM-207)

CAPACITORS

Mark	Part No.	Symbol & Description	
	ACM-014	TC101,TC102	Ceramic trimmer
	ACM-006	TC103	Trimmer
	ACM-015	TC201,TC202	Ceramic trimmer
	ACH-309	C303,C304,C315,C316	Electrolytic(2.2/50V)
	ACH-224	C411,C414	Electrolytic(8000/42V)
	ACG-019	C412,C415	Ceramic (0.01/AC150V)
	CEANL R47M 50	C150	
	CEANL 010M 50	C137,C138	
	CEANL 2R2M 50	C321,C322,C328,C329	
	CEANL 100M 50	C340,C341	
	CEANL 470M 16	C307,C308	
	CEANL 4R7M 50	C135	
	CEA R33M 50L	C408	
	CEA R68M 50L	C233	
	CEA R47M 50L	C147,C148,C209	
	CEA 010M 50L	C122,C232	
	CEA 2R2M 50L	C127	
	CEA 4R7M 50L	C206	
	CEA 100M 50L	C149,C223,C362,C363,C401	
	CEA 3R3M 50L	C212	
	CEA 220M 25L	C360,C361	
	CEA 470M 25L	C333,C405,C409,C413	
	CEA 470M 50L	C402	
	CEA 101M 10L	C132	
	CEA 221M 10L	C358,C359	
	CEA 221M 35L	C327,C410	
	CEA 221M 16L	C134	
	CEA 331M 50L	C330	
	CEA 470M 16L	C213	
	CEA 221M 80L	C403	
	CEA 470M 80L	C404	
	CEA 471M 25L	C418	
	CQSA 511L 50	C136	
	CQSA 431J 50	C204	
	CQMA 302J 50	C311,C312	
	CGB R47K 500	C107	
	CQMA 103J 50	C309,C310	
	CQMA 183K 50	C344,C345	
	CQMA 104K 50	C348,C349	
	CQMA 273K 50	C350,C351	
	CQMA 333K 50	C356,C357	
	CCDCH 220J 50	C229,C230	
	CCDUJ 040C 50	C101,C102	
	CCDTH 100D 50	C104,C105	
	CCDSL 060D 50	C106	
	CCDTH 120J 50	C114,C115	
	CCDCH 020C 50	C113	

Mark	Part No.	Symbol & Description
	CCDCH 080D 50	C116
	CCDCH 150J 50	C112,C118
	CCDCH 330J 50	C117
	CCDSL 101J 50	C108,C301,C302
	CCDSL 221J 59	C125,C331,C332
	CCDSL 100D 50	C313,C314,C342,C343
	CCDSL 101K 500	C354,C355, C203, C225
	CCDSL 220K 500	C352,C353
	CKDYB 472K 50	C346,C347
	CCDSL 271J 50	C323,C324
	CKDYX 273M 25	C139,C140
	CKDYB 561K 50	C141,C142
	CKDYB 182K 50	C145,C146
	CKDYB 222K 50	C143,C144,C217,C334,C335
	CKDYB 392K 50	C317,C318
	CKDYB 471K 50	C305,C306
	CKDYF 223Z 50	C215,C218,C221,C222
	CKDYB 102K 50	C111,C214,C219,C227
	CCDSL 470J 50	C319,C320,C336–C339
	CKDYF 103Z 50	C103, C109, C110, C119, C120, C201, C202, C207, C211, C224, C226, C228, C231, C234 C325, C326, C153
	CKDYF 473Z 50	C121, C123, C124, C126, C128, C129, C130, C131, C133, C205, C216, C210, C220, C364, C365, C406, C407

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
	★ ACP-079	VR101	Semi-fixed (5k-B)
	★ ACT-023	VR302	Variable(BALANCE)
	★ ACT-140	VR303,VR304	Variable(TREBLE, BASS)
	★ C92-051	VR305,VR306	Semi-fixed (4.7k-B)
	ACN-114	R419,R420	Wire wound (0.47+0.47/5W+5W)
⚠	ACN-133	R505	Wire wound (47/10W)
⚠	ACN-029	R516	Carbon composition (2.2M/½W)
⚠	RS3P □□□J	R511	
	RN¼PQ □□□□F	R136	
⚠	RD½PSF □□□J	R389,R415–R418,R421–R424	
	RD½PS □□□J	R201,R425–R428,R512,R515	
	RD¼PM □□□JNL	R305–R308	
⚠	RD¼PMF □□□J	R208,R406–R408,R410,R503	
	RD¼PM □□□J	R101–R135, R137–R150, R202–R207, R209–R227, R229–R250, R255, R256, R301–R304, R309–R329, R332, R353, R360–R388, R390–R405	
	RD¼PM □□□J	R411–R414, R419, R420, R429, R430, R501, R502, R504–R510, R513, R514, R516	
	RD1/8PM □□□J	R251–R254	

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	LA1247	Q201
★★	M54922P	Q207
★★	PA3001-A	Q107
★★	HA1156W-P	Q108
★★	PA4008 (PA0001)	Q329
★★	JC501 (2SC2603/A/)	Q109, Q203–Q205, Q208–Q212, Q313, Q314, Q405
★★	2SC1919 (2SC1845)	Q202, Q301, Q302
★★	2SC2362 (2SC2240) (2SC1775A)	Q309,Q310
★★	2SC1384 (2SD438)	Q401
★★	2SC535	Q102
★★	2SC1845 (2SC2240)	Q307,Q308
★★	2SC461 (2SC710)	Q104,Q105
★★	2SC2603/A/	Q315–Q318
★★	2SD880 (2SD313)	Q402,Q403
★★	2SA850-D* (2SA850-C*) (2SB560-D*) (2SB560-E*)	Q321,Q322
★★	2SC1735-D* (2SC1735-C*) (2SD438-D*) (2SD438-E*)	Q323,Q324

*hfe of Q321–Q324 should have the same value.

★★	2SA798	Q305,Q306
★★	2SA1115/A/	Q311,Q312,Q319,Q320
★★	2SA726S (2SA992)	Q110,Q111,Q303,Q304
★★	2SA684A (2SB560)	Q404
★★	JA101 (2SA1115/A/)	Q106,Q206,Q213–Q215
★★	2SB686-R* (2SB686-O*)	Q325,Q326
★★	2SD716-R* (2SD716-O*)	Q327,Q328

*hfe of Q325–Q328 should have the same value.

★★	2SK168 (2SK61-GR)	Q101,Q103
★	KZL120	D205
★	KZL056	D407

Mark	Part No.	Symbol & Description
★	KZL140	D301, D403
★	WZ-048 (MZ-047)	D206
★	WZ-290	D401
★	MZ-150 (WZ-150)	D416
★	KZL072	D402
★	WZ-046 (MZ-047)	D306–D309
⚠ ★	1S2471	D407,D408
★	1S1555 (1S2473)	D104, D105, D203, D204, D207–D209, D302–D305, D310–D316, D417
★	GP-25D (30D2)	D412–D415
★	10E2 (S1B01–02)	D404,D405
★	2–1K261	D411
★	KV1320A-3	D101
★	KV1226-Y	D201

* KV1320A-3 consists of three twin vari-cap diodes with the indentical characteristics.
* KV1226-Y consists of two vari-cap diodes with the indentical characteristics.

	TH103–2	Th301,Th302

COILS,FILTERS

Mark	Part No.	Symbol & Description	
	ATC-112	L101	FM ANT. coil
	ATC-131	L102	FM RF coil
	ATC-115	L103	FM OSC. coil
	ATH-049	L104	RF choke coil
	ATB-636	L202	Bar-antenna assembly
	ATB-067	L203	AM OSC. coil
	ATE-039	T101	FM IF transforerm
	ATE-052	T102	FM DET. transformer
	ATB-069	T201	AM IF coil
	ATF-126	F101,F102	FM ceramic filter
	ATF-121	F201	AM ceramic filter

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASG-300	S101	4-ganged push switch
★	ASS-016	X202	Crystal resonator
★	ATF-125	X201	Ceramic resonator
	AKA-017	Terminal (ANTENNA)	
	AKB-077	Terminal (PLAY)	
	AKB-079	Terminal (PHONO,AUX/VIDEO, REC)	
	AEC-818	Mica wafer	
	ABA-258	Screw	
	PBZ30P060FMC	Screw 3X6	
	VBZ30P060FMC	Screw 3X6	

Switch Assembly

Mark	Part No.	Symbol & Description	
★★	ASH-015	S102	Slide switch (AM CHANNEL STEP)

Volume Assembly

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description	
★	ACT-128	VR301	Variable (VOLUME)
	RD¼PM □□□J	R354–R359	

Headphones Jack Assembly

Mark	Part No.	Symbol & Description	
	RD½PS 331J	R429,R430	Carbon film resistor
	AKN-029	Phone jack (PHONES)	

Control Assembly (GWX-706)

CAPACITORS

Mark	Part No.	Symbol & Description
	CKDYB 331K 50	C3
	CKDYB 102K 50	C4
	CEA 101M 25L	C5
	CKDYF 103Z 50	C7
	CEA 470M 25L	C8

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□J	R4–R6, R8, R23–R32, R35, R42, R43,R45,R46,R53
	RD1/4PM □□□J	R9–R22,R34,R41,R44
⚠	RD1/4PMF □□□J	R52

SEMICONDUCTORS

Mark	Part No.	Symbol & Description	
★★	TD6301P	Q2	
★★	TC4049BP	Q3	
★★	PD6004	Q5	
★★	M74LS42P	Q6	
★	2–1K261	D1–D10,D15	
★	1S1555 (1S2473)	D12,D14,D16	
★	AEL-365	D17,D19–D25,D29,D30	LED(Red)
★	AEL-351	D26–D28	LED(Green)
★	AEL-378	D32	LED numeric display

OTHERS

Mark	Part No.	Symbol & Description	
★★	ASG-177	S1–S13	Tact switch
★	ASS-017	X1	Ceramic resonator
	PBZ25P100FMC	Screw 2.5X10	

Control Assembly A

Mark	Part No.	Symbol & Description
★★	JC501 (2SC2603/A/)	Q10–Q12
	RD¼PM 681J	R33
	RD1/8PM 681J	R39,R40

Control Assembly B

CAPACITORS

Mark	Part No.	Symbol & Description
	CEA 101 50L	C1
	CEA 010M 50L	C2
	CKDYF 103Z 50	C6

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD1/8PM □□□J	R36–R38, R47–R49, R51, R54,R55,R57
	RD1/4PM □□□J	R50,R56

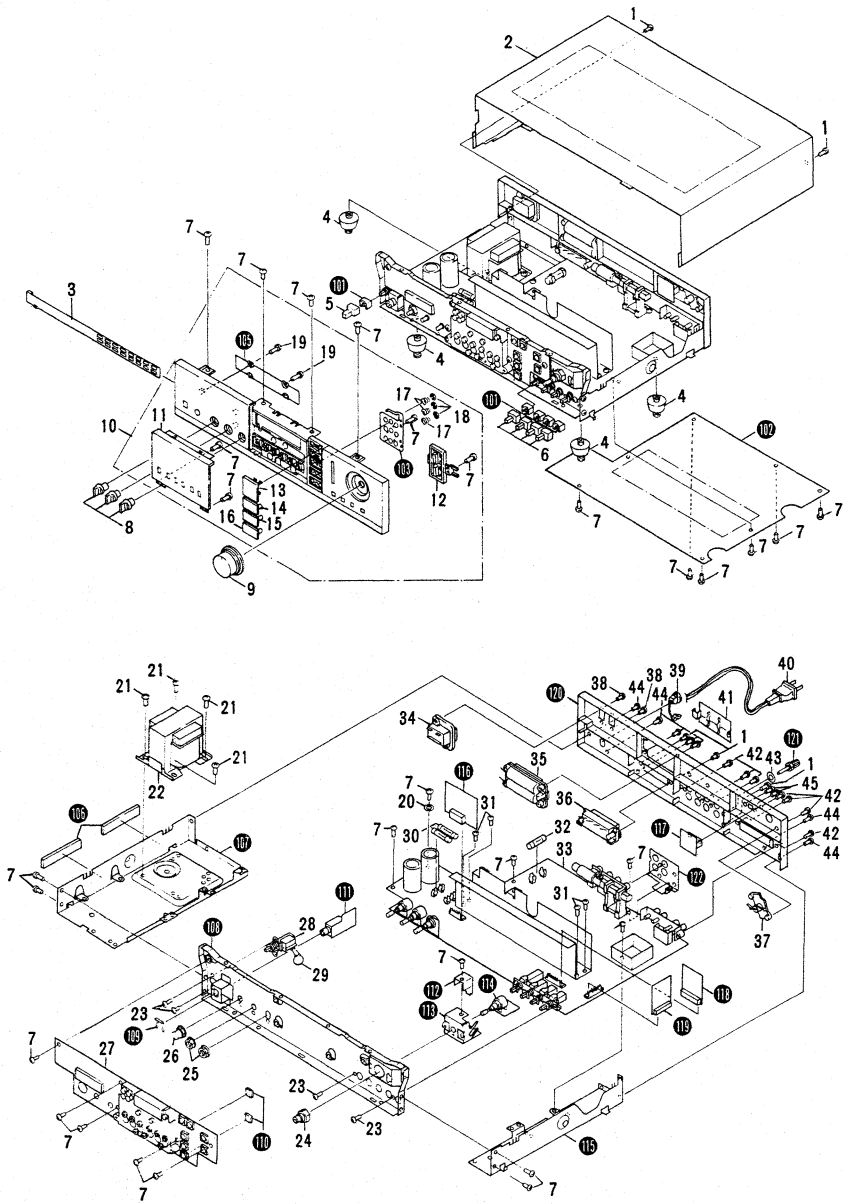
SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	TC4069UBP	Q4
★★	JC501 (2SC2603/A/)	Q8,Q9,Q15,Q16
★	1S1555 (1S2473)	D11,D13,D33
★	SZ-027	D31

Connector Assembly

Mark	Part No.	Symbol & Description
★	10E2	D18

9. EXPLODED VIEW



Parts List of Exploded View

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ *GENERALLY MOVES FASTER THAN* ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Mark	No.	Part No.	Description
	1.	BBT30P100FZK	Screw 3X10
	2.	ANE-369	Top cover
	3.	ANR-455	Slider assembly
	4.	AEC-838	Foot assembly
	5.	AAD-406	Knob (POWER)
	6.	AAD-405	Knob
	7.	VBZ30P060FMC	Screw 3X6
	8.	AAB-274	Knob(BASS,TREBLE, BALANCE)
	9.	AAB-273	Knob (VOLUME)
	10.	ANM-074	Front panel assemly
	11.	ANR-407	Display cover
	12.	AAD-399	Knob (INPUT)
	13.	AAD-400	Knob (TUNING)
	14.	AAD-402	Knob (FM)
	15.	AAD-403	Knob (AM)
	16.	AAD-404	Knob (MEMORY/STOP)
	17.	ABH-088	Coiled spring
	18.	YE40FUC	E-type washer
	19.	BBZ30P050FMC	Screw 3X5
	20.	ABE-052	Washer
	21.	VTZ40P080FMC	Screw 4X8
⚠ ★	22.	ATT-840	Power transformer
	23.	VMZ30P060FMC	Screw 3X6
	24.	ABN-047	Union nut
	25.	NK90FMC	Nut M9
	26.	ABN-028	Nut
	27.	GWX-706	Control assembly
⚠ ★★	28.	ASG-521	Push switch (POWER)
⚠	29.	ACG-017	Ceramic capacitor
⚠ ★★	30.	AEK-109	Fuse (6A,FU102,FU103)
	31.	VBZ30P080FMC	Screw 3X8
⚠ ★★	32.	AEK-100	Fuse (4A,FU101)
	33.	GWM-207	Complex assembly
⚠	34.	AKP-039	AC socket (AC OUTLETS)
	35.	AXC-013	Battery case
⚠	36.	AKE-101	Terminal (SPEAKERS)
	37.	AKB-076	Terminal (AM STEREO OUT)
	38.	MTZ30P100FZK	Screw 3X10
	39.	AEC-358	Strain relief
⚠	40.	ADG-052	AC power cord
	41.	ANR-432	Case cover
	42.	VBZ30P120FZK	Screw 3X12
	43.	WA35F100N080	Washer 3.5φ
	44.	BBT30P100FZK	Screw 3X10
	45.	PMT30P060FZB	Screw 3X6
	101.		Flexible joint
	102.		Bottom plate
	103.		Ground plate
	104.		. . .
	105.		Slider guide
	106.		Cushion
	107.		Transformer frame
	108.		Panel stay
	109.		Stopper
	110.		Cushion
	111.		Headphones jack assembly
	112.		Shield case
	113.		VR holder
	114.		Volume assembly
	115.		Side frame R
	116.		Control assembly B
	117.		Switch assembly
	118.		Control assembly A
	119.		Connector assembly
	120.		Rear Panel
	121.		Terminal (GND)

10. ADJUSTMENTS

Idel Current Adjustment

- Turn VR305 (L) and VR306 (R) fully around in the counter-clockwise.
- Without any load or input signal, turn POWER switch ON and let stand for 10 minutes.

Adjustment Point	Prescribed value	Measuring terminal
VR305 (L)	23.5mV (14.1–37.6mV)	Between terminal TP-L (+) and SPEAKERS (+L) terminal on the rear panel.
VR306 (R)	23.5mV (14.1–37.6mV)	Between terminal TP-R (+) and SPEAKERS (+R) terminal on the rear panel.

FM Tuner

- Connect the FM signal generator (FM SG) to the FM ANTENNA 300Ω terminal through a 300Ω dummy antenna.
- Set the AUTO/MANUAL switch to the MANUAL position, the FM (FUNCTION) switch to the ON position and the MODE MONO (MUTE OFF) switch to the MONO (MUTE OFF) position.

(*1) Tune the FM SG to the SX-5.

(*2) Connect the FM multiplex stereo signal generator to the FM SG external modulator terminal. Set the modulation to Main 1kHz/L+R/±67.5kHz deviation, Pilot 19kHz/±7.5kHz deviation.

Step	FM SG (400Hz, ±75kHz deviation)		SX-5 Frequency dipslay	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		87.5MHz	L103	7.2V DC between terminal no. 36 and ground.
2	No signal		108.0MHz	TC103	25V DC between terminal no. 36 and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	90.0MHz (*1)	30dB	90.0MHz	L101, L102	Adjust until DC voltage between Q107 (IC) pin 13 and ground is maximum.
5	106.0MHz (*1)	30dB	106.0MHz	TC101, TC102	
6	Repeat steps 4 and 5 until maximum sensitivity is attained.				
7	98.0MHz (*1)	30dB	98.0MHz	T101	Adjust until DC voltage between Q107 (IC) pin 13 and ground is maximum.
8	No signal		98.0MHz	T102	0V DC between Q107 (IC) pin 7 and pin 10.
9	Set the MODE MONO switch to the STEREO position.				
10	98.0MHz (*1)	60dB (not modulation)	98.0MHz	VR101	Adjust signal at terminal no. 14 to 19kHz (±100Hz).
11	98.0MHz (*1) Set to stereo modulation (*2)	60dB	98.0MHz	T101 (within ±90°)	Adjust until distortion at TAPE 1 REC L or R terminal is minimum.
12	98.0MHz (*1)	Variable	98.0MHz	R126	Confirm that muting operation stops above 36dB – if not remove R126.

AM Tuner

- Connect the AM signal generator (AM SG) to the AM ANTENNA terminal through a 10kΩ resistor.
- Set the AM (FUNCTION) switch to the ON position and AM CHANNEL STEP switch (on the rear panel) to 10kHz position.

(*3) Tune the AM SG to the SX-5.

Step	AM SG (400Hz, 30% modulation)		SX-5 Frequency dipslay	Adjustment point	Adjustment procedure
	Frequency	Level			
1	No signal		520kHz	L203	2V DC between terminal no. 36 and ground.
2	No signal		1620kHz	TC202	25V DC between terminal no. 36 and ground.
3	Repeat steps 1 and 2 until both specifications are correct.				
4	600kHz (*3)	40dB	600kHz	L202	Adjust until DC voltage between Q201 (IC) pin 16 and ground is maximum.
5	1400kHz (*3)	40dB	1400kHz	TC201	
6	Repeat steps 4 and 5 until maximum sensitivity is attained				

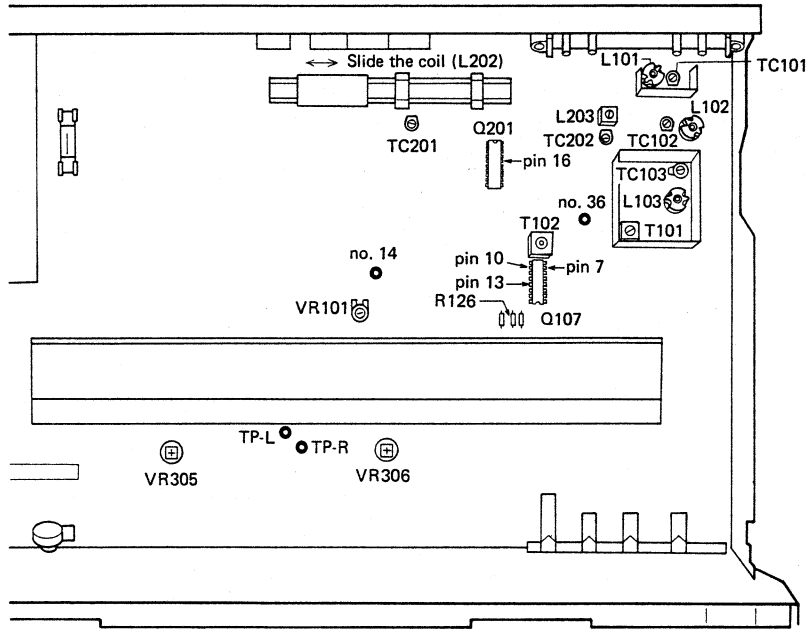


Fig. 11-1 Adjustment and measuring points

10. RÉGLAGE

Réglage du courant déwatté

- Tourner VR305 (gauche) et VR306 (droit) complètement dans le sens contraire des aiguilles d'une montre.
- Régler l'interrupteur général (POWER) sur ON sans appliquer de charge ou de signal d'entrée et laisser en position d'attente pendant 10 minutes.

Point de réglage	Valeur prescrite	Borne de mesure
VR305 (gauche)	23,5mV (14,1 – 37,6 mV)	Entre la borne d'épreuve point - gauche (TP-L) (+) et la borne SPEAKERS A (+gauche) sur le panneau arrère.
VR306 (droit)	23,5mV (14,1 – 37,6 mV)	Entre la borne d'épreuve point - droit (TP-R) (+) et la borne SPEAKERS A (+droit) sur le panneau arrière.

Tuner FM

- Raccorder le générateur de signaux (FM SG) sur la borne de l'antenne FM (FM ANTENNA) 300Ω par l'intermédiaire d'une antenne factice 300Ω.
- Régler le commutateur AUTO/MANUAL sur la position MANUAL, le commutateur FM (FUNCTION) sur la position ON et le commutateur MODE MONO (MUTE OFF) sur la position MONO (MUTE OFF).

(*1) Accorder le générateur de signaux FM sur SX-5.

(*2) Raccorder le générateur de signaux FM stéréo multiplex sur la borne du modulateur externe FM SG. Régler la modulation sur déviation principale 1kHz / gauche+droit (L+R) / ±67,5kHz, déviation de synchronisation 19kHz / ±7,5kHz.

Phase	FM SG (400Hz, ±75kHz déviation) Fréquence	Niveau	Affichage de fréquence SX-5	Point de réglage	Méthode de réglage
1	Pas de signal		87,5MHz	L103	7,2V CC entre la borne nº 36 et la borne de terre.
2	Pas de signal		108,0MHz	TC103	25V CC entre la borne nº 36 et la borne de terre.
3	Répéter les phases 1 et 2 afin d'obtenir les deux caractéristiques correctes.				
4	90,0MHz (*1)	30dB	90,0MHz	L101,L102	Régler afin d'obtenir la tension CC maximum entre la broche 13 Q107 (CI) et la terre.
5	106,0MHz (*1)	30dB	106,0MHz	TC101, TC102	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				
7	98,0MHz (*1)	30dB	98,0MHz	T101	Régler afin d'obtenir la tension CC maximum entre la broche 13 Q107 (CI) et la terre.
8	Pas de signal		98,0MHz	T102	0V CC entre la broche 7 Q107 (CI) et la broche 10.
9	Régler le commutateur MODE MONO sur la position STEREO.				
10	98,0MHz (*1)	60dB (pas de modulation)	98,0MHz	VR101	Régler le signal à la borne nº 14 sur 19kHz (±100Hz).
11	98,0MHz (*1) Régler sur modulation stéréo (*2)	60dB	98,0MHz	T101 (entre ±90°)	Régler afin d'obtenir la distorsion minimum à la borne TAPE 1 REC L ou R.
12	98,0MHz (*1)	Variable	98,0MHz	R126	S'assurer que la suppression de sensibilité s'arrête au dessus de 36dB. Dans le cas contraire, enlever R126.

Tuner AM

- Raccorder le générateur de signaux AM (AM SG) sur la borne d'antenne AM (AM ANTENNA) par l'intermédiaire d'un résisteur de 10KΩ.
- Régler le commutateur AM (FUNCTION) sur la position ON et le commutateur AM CHANNEL STEP (situé sur le panneau arrière) sur la position 10kHz.

(*3) Accorder le générateur de signaux AM SG sur SX-5.

Phase	AM SG (400Hz, 30% modulation) Fréquence	Niveau	Affichage de fréquence SX-5	Point de réglage	Méthode de réglage
1	Pas de signal		520kHz	L203	2V CC entre la borne nº 36 et la borne de terre.
2	Pas de signal		1620kHz	TC202	25V CC entre la borne nº 36 et la borne de terre.
3	Répéter les phases I et 2 afin d'obtenir les deux caractéristiques correctes.				
4	600kHz (*3)	40dB	600kHz	L202	Régler afin d'obtenir la tension CC maximum entre la broche 16 Q201 (CI) et la terre.
5	1400kHz (*3)	40dB	1400kHz	TC201	
6	Répéter les phases 4 et 5 afin d'obtenir la sensibilité maximum.				

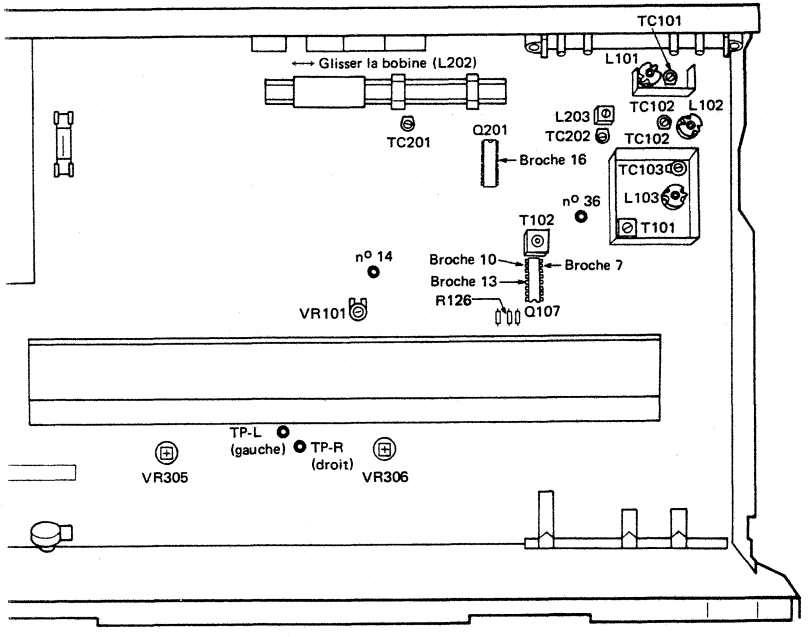


Fig. 11-1 Points de réglage et de mesure

10. AJUSTE

Ajuste de la corriente devatiada

- Girar completamente VR305 (izq.) VR306 (der.) hacia la izquierda.
- Sin ninguna carga ni señal de entrada, poner el interruptor de la alimentación (POWER) en la posición ON y dejarlo así durante 10 minutos.

Punto de ajuste	Valor prescrito	Terminal de medición
V305 (izq.)	23,5mV (14,1 – 37,6 mV)	Entre el terminal de prueba de punto - izq. (TP-L) (+) y el terminal SPEAKERS A (+izq.) del panel posterior.
VR306 (der.)	23,5mV (14,1 – 37,6 mV)	Entre el terminal de prueba de punto - der. (TP-R) (+) y el terminal SPEAKERS A (+der.) del panel posterior.

Sintonizador de FM

- Conectar el generador de señales de FM (FM SG) al terminal FM ANTENNA 300Ω a través de una antena ficticia de 300ohmios.
- Conectar el selector AUTO/MANUAL en la posición MANUAL, el selector de función de FM en la posición ON y el de modo de MONO (MUTE OFF) en la posición MONO (MUTE OFF).

(*1) Sintonizar el FM SG con el SX-5.

(*2) Conectar un generador de señales estereofónicas de FM multiplex al terminal modulador exterior del FM SG. Ajustar la modulación a Principal 1kHz / Izq. + Der. (L+R) / ±67,5kHz de desviación; Piloto 19kHz / ±7,5kHz de desviación.

Paso	FM SG (400Hz, ±75kHz desviación) Frecuencia	Nivel	Frecuencímetro del SX-5	Punto de ajuste	Procedimientos de ajuste
1	Sin señal		87,5MHz	L103	7V CC entre el terminal no. 36 y masa.
2	Sin señal		108,0MHz	TC103	24V CC entre el terminal no. 36 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	90,0MHz (*1)	30dB	90,0MHz	L101, L102	Ajustar hasta que la tensión de CC entre la clavija 13 de Q107 (IC) y tierra sea la máxima.
5	106,0MHz (*1)	30dB	106,0MHz	TC101, TC102	
6	Repetir los pasos 4 y 5 hasta lograrse la máxima sensibilidad.				
7	98,0MHz (*1)	30dB	98,0MHz	T101	Ajustar hasta que la tensión de CC entre la clavija 13 de Q107 (IC) y tierra sea la máxima.
8	Sin señal		98,0MHz	TC102 (CENTER)	0V CC entre la clavija 7 y la clavija 10 de Q107 (IC).
9	Poner el selector MODE MONO en la posición STEREO.				
10	98,0MHz (*1)	60dB (sin modulación)	98,0MHz	VR101	Ajustar la señal en el terminal no. 14 a 19kHz (±100Hz).
11	98,0MHz (*1) Ajustar a modulación estereofónica (*2)	60dB	98,0MHz	T101 (dentro de ±90°)	Ajustar hasta que la distorsión en el terminal TAPE 1 REC L o R sea la mínima.
12	98,0MHz (*1)	Variable	98,0MHz	R126	Confirmar que se detiene la operación de silenciamiento por encima de los 36dB – si no se detiene, extraer R126.

Sintonizador de AM

- Conectar el generador de señales de AM (AM SG) al terminal AM ANTENNA a través de un resistor de 10Kohmios.
- Poner el selector de función de AM en la posición ON y el de AM CHANNEL STEP (del panel posterior) en la posición de 10kHz.

(*3) Sintonizar el AM SG con el SX-5.

Paso	AM SG (400Hz, 30% modulación) Frecuencia	Nivel	Frecuencímetro del SX-5	Punto de ajuste	Procedimientos de ajuste
1	Sin señal		520kHz	L203	2V CC entre el terminal no. 36 y masa.
2	Sin señal		1620kHz	TC202	24V CC entre el terminal no. 36 y masa.
3	Repetir los pasos 1 y 2 hasta que ambas especificaciones sean correctas.				
4	600kHz (*3)	40dB	600kHz	L202	Ajustar hasta que la tensión de CC entre la clavija 16 de Q201 (IC) y tierra sea la máxima.
5	1400kHz (*3)	40dB	1400kHz	TC201	
6	Repetir los pasos 4 y 5 hasta logarse la máxima sensibilidad.				

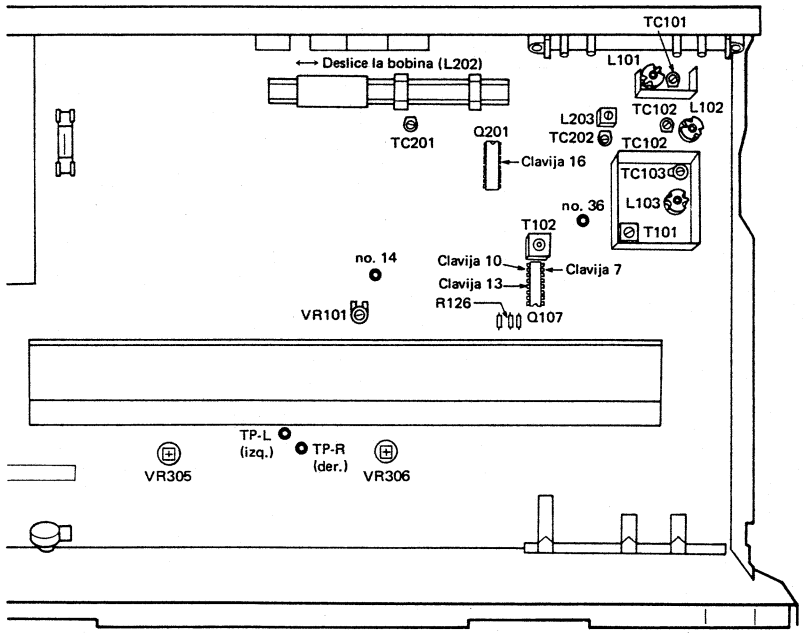


Fig. 11-1 Puntos de ajuste y de medición